

CLAIMS

What is claimed is:

1 1. Circuitry comprising:
2 a hybrid to combine signals from a pair of antennas and to provide a sum
3 signal and a difference signal; and
4 switching circuitry to select between the sum signal and the difference
5 signal based on a signal quality of the sum and difference signals.

1 2. The circuitry of claim 1 wherein the hybrid has a first antenna port to
2 couple with a first of the antennas, a second antenna port to couple with a second
3 of the antennas, and a first and a second switch port to provide respectively the
4 sum signal and the difference signal,
5 wherein a signal path between at least some of the ports is a compressed
6 signal path having a plurality of 90-degree bends therein to reduce spacing
7 between the at least some of the ports.

1 3. The circuitry of claim 1 wherein the hybrid comprises reactive-power
2 dividers associated with a first antenna port and a first switch port,
3 wherein the hybrid is to provide substantially a predetermined phase
4 difference between the first antenna port and the first switch port, and
5 wherein the reactive power-dividers associated with the first antenna port
6 and the first switch port are spaced closer than a physical distance associated
7 with the predetermined phase difference in a stripline medium.

1 4. The circuitry of claim 3 wherein the signal path between the reactive
2 power-dividers comprises the plurality of 90-degree bends to reduce a distance
3 between the reactive power-dividers to less than a distance associated with the
4 predetermined phase difference.

1 5. The circuitry of claim 2 wherein the hybrid is a 180-degree compact
2 hybrid,

3 wherein signal paths between ports of the hybrid comprise stripline,
4 wherein the sum signal comprises signals from the antennas combined
5 substantially in-phase, and
6 wherein the difference signal comprises signals from the antennas
7 combined substantially out-of-phase.

1 6. The circuitry of claim 1 wherein the switching circuitry further
2 comprises logic circuitry to compare a packet error rate between the sum and
3 difference signals and to select one of the signals which has a lower packet error
4 rate.

1 7. The circuitry of claim 6 further comprising transceiver circuitry to
2 measure the packet error rate of the sum and difference signals, and to receive
3 the selected signal from the switching circuitry for subsequent demodulation.

1 8. The circuitry of claim 7 wherein the signals comprise orthogonal
2 frequency-division multiplexed signals comprising a plurality of orthogonal
3 symbol-modulated subcarriers in a 5 GHz frequency spectrum.

1 9. The circuitry of claim 7 wherein the signals comprise direct-sequence
2 spread-spectrum modulated signals in a 2.4 GHz spectrum.

1 10. The circuitry of claim 7 wherein the signals comprise one of either
2 orthogonal frequency-division multiplexed signals comprising a plurality of
3 symbol-modulated subcarriers or complementary code keying-modulated signals,
4 the signals being in a 2.4 GHz frequency spectrum.

1 11. The circuitry of claim 2 wherein the hybrid is to provide substantially
2 a $\frac{3}{4}$ wavelength phase difference between the first antenna port and the first
3 switch port,
4 wherein the hybrid is to provide substantially a $\frac{1}{4}$ wavelength phase
5 difference between the first antenna port and the second switch port,

6 wherein the hybrid is to provide substantially a $\frac{1}{4}$ wavelength phase
7 difference between the second antenna port and the second switch port, and
8 wherein the hybrid is to provide substantially a $\frac{1}{4}$ wavelength phase
9 difference between the second antenna port and the first switch port.

1 12. The circuitry of claim 1 wherein the hybrid is a first hybrid to operate
2 in a first frequency spectrum, and wherein the circuitry further comprises:
3 a second hybrid to operate in a second frequency spectrum; and
4 diplexing circuitry to provide signals received through the antennas in the
5 first frequency spectrum to the first hybrid, and to provide signals received
6 through the antennas in the second frequency spectrum to the second hybrid.

1 13. The circuitry of claim 12 wherein the diplexing circuitry is first
2 diplexing circuitry, wherein the circuitry further comprises second diplexing
3 circuitry, wherein the first hybrid is to provide a first sum signal and a first
4 difference signal in the first frequency spectrum to the second diplexing
5 circuitry, wherein the second hybrid is to provide a second sum signal and a
6 second difference signal in the second frequency spectrum to the second
7 diplexing circuitry, and
8 wherein the second diplexing circuitry is to combine the first and second
9 sum signals and the first and second difference signals to provide to the
10 switching circuitry a combined sum signal and a combined difference signal, the
11 combined sum and difference signals comprising frequencies in the first and
12 second frequency spectrums.

1 14. The circuitry of claim 12 wherein the switching circuitry is first
2 switching circuitry and wherein the circuitry further comprises second switching
3 circuitry,
4 wherein the first hybrid is to provide a first sum signal and a first
5 difference signal in the first frequency spectrum to the first switching circuitry,
6 and the second hybrid is to provide a second sum signal and a second difference
7 signal in the second frequency spectrum to the second switching circuitry, and

8 wherein the second switching circuitry is to select either the second sum
9 signal or the second difference signal based on a signal quality of the second sum
10 and difference signals.

1 15. The circuitry of claim 14 wherein the first switching circuitry is to
2 provide either the sum or the difference signal in the first frequency spectrum to
3 a first transceiver to process signals from the first frequency spectrum, and
4 wherein the second switching circuitry is to provide either the sum or the
5 difference signal in the second frequency spectrum to a second transceiver to
6 process signals from the second frequency spectrum.

1 16. The circuitry of claim 12 wherein the signals comprise orthogonal
2 frequency-division multiplexed signals comprising a plurality of symbol-
3 modulated subcarriers, and
4 wherein the first frequency spectrum is a 5 GHz frequency spectrum and
5 the second frequency spectrum is a 2.4 GHz frequency spectrum.

1 17. A method comprising:
2 generating a sum signal and a difference signal with a hybrid from a pair
3 of antennas; and
4 selecting between the sum signal and the difference signal based on a
5 packet error rate of the signals.

1 18. The method of claim 17 wherein the generating comprises providing
2 substantially a predetermined phase difference between a first antenna port and a
3 first switch port of the hybrid, wherein a signal path between reactive power-
4 dividers associated with the ports comprises a plurality of 90-degree bends to
5 reduce a distance between the reactive power-dividers to less than a distance
6 associated with the predetermined phase difference.

1 19. The method of claim 18 further comprising:
2 measuring the packet error rate of the sum signal and the difference
3 signal;

4 comparing the measured packet error rates; and
5 demodulating the selected signal,
6 wherein the signals comprise orthogonal frequency-division multiplexed
7 signals comprising a plurality of symbol-modulated subcarriers in a
8 predetermined frequency spectrum, the predetermined frequency spectrum
9 comprising either a 5 GHz frequency spectrum or a 2.4 GHz frequency spectrum.

1 20. The method of claim wherein 19 the generating comprises:
2 generating a first sum signal and a first difference signal in a first
3 frequency spectrum with a first hybrid from a pair of antennas;
4 generating a second sum signal and a second difference signal in a second
5 frequency spectrum with a second hybrid from the pair of antennas; and
6 separating the signals received through the pair of antennas into signals
7 of the first and second frequency spectrums prior to generating the sum and
8 difference signals, and
9 wherein the selecting comprises selecting between either the first sum
10 signal and the first difference signal, or the second sum signal and the second
11 difference signal.

1 21. The method of claim 20 further comprising combining the first and
2 second sum signals and the first and second difference signals prior to
3 demodulating.

1 22. A hybrid comprising:
2 four reactive power-dividers; and
3 signal paths coupling the reactive power-dividers to provide a
4 predetermined phase difference therebetween,
5 wherein the signal paths have a plurality of 90-degree bends therein to
6 reduce a distance between the coupled reactive power-dividers to less than a
7 distance associated with the predetermined phase difference.

1 23. The hybrid of claim 22 wherein the hybrid is a 180-degree hybrid
2 fabricated in either a stripline or microstrip medium and is to combine signals
3 from a pair of antennas to provide a sum signal and a difference signal,
4 wherein the hybrid further comprises:
5 a first antenna port to couple with a first of the antennas;
6 a second antenna port to couple with a second of the antennas; and
7 first and second switch ports to provide, respectively, the sum signal and
8 the difference signal, the sum signal comprising signals from the antennas
9 combined substantially in-phase, the difference signal comprising signals from
10 the antennas combined substantially out-of-phase.

1 24. The hybrid of claim 23 wherein the signals comprise orthogonal
2 frequency-division multiplexed signals comprising a plurality of symbol-
3 modulated subcarriers in a predetermined frequency spectrum, the predetermined
4 frequency spectrum comprising either a 5 GHz frequency spectrum or a 2.4 GHz
5 frequency spectrum,
6 wherein the hybrid is to provide substantially a $\frac{3}{4}$ wavelength phase
7 difference between the first antenna port and the first switch port,
8 wherein the hybrid is to provide substantially a $\frac{1}{4}$ wavelength phase
9 difference between the first antenna port and the second switch port,
10 wherein the hybrid is to provide substantially a $\frac{1}{4}$ wavelength phase
11 difference between the second antenna port and the second switch port, and
12 wherein the hybrid is to provide substantially a $\frac{1}{4}$ wavelength phase
13 difference between the second antenna port and the first switch port.

1 25. A wireless communication device comprising:
2 a pair of substantially omnidirectional antennas;
3 a hybrid to receive signals from the pair of antennas and to provide a sum
4 signal and a difference signal; and
5 switching circuitry to select between either the sum signal or the
6 difference signal based on a signal quality of the sum and difference signals.

1 26. The device of claim 25 wherein the hybrid has a first antenna port to
2 couple with a first of the antennas, a second antenna port to couple with a second
3 of the antennas, and a first and a second switch port to provide respectively the
4 sum signal and the difference signal,

5 wherein the hybrid has a reactive power-divider associated with the ports
6 and is to provide a predetermined phase difference between the ports,

7 wherein a signal path between the reactive power-dividers comprise 90-
8 degree bends to reduce a distance between the reactive power-dividers to less
9 than a distance associated with the predetermined phase difference, and

10 wherein the switching circuitry further comprises logic circuitry to
11 compare a packet error rate between the sum and difference signals and to select
12 one of the signals having lower packet error rate.

1 27. The device of claim 25 wherein the signals comprise orthogonal
2 frequency-division multiplexed signals comprising a plurality of symbol-
3 modulated subcarriers in a predetermined frequency spectrum, the predetermined
4 frequency spectrum comprising either a 5 GHz frequency spectrum or a 2.4 GHz
5 frequency spectrum, and

6 wherein the device further comprises transceiver circuitry to measure the
7 packet error rate of the sum and difference signals, and to receive the selected
8 signal from the switching circuitry for subsequent demodulation.

1 28. An article comprising a storage medium having stored thereon
2 instructions, that when executed by a computing platform, result in selecting
3 between a sum signal and a difference signal based on a packet error rate of the
4 signals, the sum signal and the difference signal being generated with a hybrid
5 from a pair of antennas.

1 29. The article of claim 28 wherein the instructions, when further
2 executed by the computing platform result in further selecting between the sum
3 signal and the difference signal,

4 wherein the signals are generated by providing substantially a
5 predetermined phase difference between at least some ports of the hybrid, and

6 wherein a signal path between reactive power-dividers associated with
7 the ports comprises a plurality of 90-degree bends to reduce a distance between
8 the reactive power-dividers to less than a distance associated with the
9 predetermined phase difference.

1 30. The article of claim 29 wherein the instructions, when further
2 executed by the computing platform result in:
3 measuring the packet error rate of the sum signal and the difference
4 signal;
5 comparing the measured packet error rates; and
6 demodulating the selected signal,
7 wherein the signals comprise orthogonal frequency-division multiplexed
8 signals comprising a plurality of symbol-modulated subcarriers in a
9 predetermined frequency spectrum, the predetermined frequency spectrum
10 comprising either a 5 GHz frequency spectrum or a 2.4 GHz frequency spectrum.